SELECTED TOPICS
In Aerospace Engineering

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APPROXIMATE FUNCTION FOR FAR-FIELD KERNEL FUNCTION OF OSCILLATING NON-PLANAR LIFTING SURFACES

25.1. Introduction

An alternative solution for the far-field kernel function for nonplanar lifting surfaces is described in this chapter. The solution shows reasonable efficiency, numerical stability and produces the results of good accuracy. Accuracy is observed for the developed solution by comparing with the target solution. The emphasis is made on subsonic flow field. This alternative solution obviates the simplicity and is readily adapted for problems of complex geometries. This study is the extension of formerly developed alternative solution of near field kernel function..

25.2. Landahl's Kernel Function Formulation

The aerodynamic analysis over the harmonically oscillating lifting surfaces is an interesting problem because of the subtle difficulties in the solution process and the widespread application of the results(Epstein 1995). To study analytical, numerical and experimental aspects of the problem in all flight regimes including subsonic, transonic and supersonic speed, there has been significant study performed. Using the fundamental theories the widely accepted Green integral equation has been developed, to evaluate aerodynamic loads on thin wings or the so-called lifting surfaces. It was proposed in 1941(Kussner 1941). Researchers are still working on to solve the kernel